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ISO 14000: Assessing Its Perceived Impact on Corporate Performance

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ABSTRACT

The ISO 14000 environmental standard is a relatively recent development in Environmentally Responsible Manufacturing (ERM). It applies to environmental systems and processes the same approach used by its predecessor, the ISO 9000 quality standards. Being relatively new, there are numerous questions regarding the impact of this new standard both on the corporate environmental management system and corporate performance. This paper addresses some of these questions, by drawing on data generated by a large-scale survey of American managers. The results indicate that, even though ISO 14000 has achieved relatively limited acceptance, there is strong evidence to indicate that this standard can positively impact both the performance of the environmental management system but also overall corporate performance. Further, it was found to outperform other ERM-initiatives such as the EPA's 33/50 program.

INTRODUCTION

The 1990s have been a time of challenge and transition. This has seen a change in management paradigms – from the paradigm of “or” to the paradigm of “and.” In the past, the managers thought in terms of trade-offs (i.e., the paradigm of “or”). That is, you could have low cost OR short lead times OR high quality OR high flexibility. You could have superior performance on any one of these dimensions. But, you could not have expected superior performance on two or more dimensions. Today, however, managers increasingly live with the paradigm of “and.” That is, managers are now expected to simultaneously reduce lead times (manufacturing, purchasing and design), improve quality, reduce costs, *AND* enhance flexibility.

This has also become a period when more and more managers are expected to become increasingly environmentally responsible and conscious. Being environmentally responsible is no longer viewed as something that is primarily done for publicity sake. It is now viewed increasingly as a requirement of doing business. For the manufacturing manager, this has meant reexamining their products and processes, with an eye toward the reduction or elimination (if possible) of any resulting waste streams. For the purchasing profession, the corresponding challenge has been to identify suppliers who can provide environmentally responsible goods and services without sacrificing cost, quality, flexibility or lead time. It

has also meant identifying and evaluating any initiative that is consistent with these new expanded objectives. One such initiative is that of the ISO 14000 environmental standard.

ISO 14000 represents a new standard and approach to improved environmental performance. ISO 14000 shares many common traits with its “cousin”, ISO 9000. It is backed by the International Organization for Standardization, which officially published the standard in 1996. As such, it is hoped that it will become a way for firms to use one standard of practices rather than dealing with the conflicting regulations across national borders (Sayre, 1996). Like its predecessor, ISO 14000 does not focus on outcomes, such as pollution output, but focuses on processes. Finally, like its “cousin”, ISO 14000 puts forth a procedure for certification that includes an audit by a third party.

This study will draw on data generated by the first large-scale survey of American managers and their positions towards ISO 14000. The development of this survey and the subsequent analysis of the data was supported by funding from the National Science Foundation, the Center of Advanced Purchasing Studies (CAPS) of the National Association of Purchasing Management (NAPM), and the Educational and Research Foundation of the American Production and Inventory Control Society (APICS).

One of the objectives of the study was to survey the relevant literature and use the researchers' experience to draw some logical conclusions as to what the costs and benefits of ISO 14000 might be. These benefits and obstacles/concerns were incorporated into the large-scale survey. The data received from this survey was intended to provide insights into how adopters and potential adopters of ISO 14000 view this development. It also helped assess the extent to which there is excitement or acceptance for ISO 14000 (as well as the degree of awareness of the need for such a standard).

UNDERSTANDING THE ISO 14000 CERTIFICATION STANDARDS

Representatives from some 50 countries around the globe have formally adopted the international standard on environmental management systems (ISO 14001) by the International Organization for Standardization in 1996. This standard attempts to build on the success and experience of its predecessor, the ISO 9000 standards, and its variants such as QS 9000 standards now being implemented within the automotive industry. If the ISO 14000 series of standards work as intended, it will set a higher level of

expected environmental management practices worldwide. Additionally, these new standards are predicted to facilitate trade and remove trade barriers.

The ISO 14000 environmental standard specifies the information technology structure in the form of an environmental management system (EMS) that an organization must have in place if it seeks to obtain certification of the EMS according to ISO guidelines. The ISO 14000 standards describe the basic elements of an effective EMS. These elements include creating an environmental policy, setting objectives and targets, implementing a program to achieve those objectives, monitoring and measuring its effectiveness, correcting problems, and reviewing the system to improve it and overall environmental performance (Tibor & Feldman, 1996).

To date, no research has addressed whether ISO 14000 will be widely used by businesses as a consensus model, or whether it should be. Instead, the literature is saturated with conflicting predictions and viewpoints offered by experts. The champions of ISO 14000 suggest that it will unify countries in their approach to environmental management and will eventually be looked upon more favorably than traditional measures (Cascio 1996). Hamner (1996) argues that small manufacturing firms constitute the largest potential market for ISO 14000, and that the real test of the standard can be measured by adoption rates among these firms, which typically need the most direction in these issues. According to Hamner the development to watch is what industrial customers do with these standards with regard to their supply chains. Acceptance of the standard will come when conformance or certification becomes a condition for customer requirements. This suggests that the predisposition of corporations to ISO 14000 will mostly influence the adoption rates and ultimately, the success of this standard. However, no research to date has examined the views of managers towards ISO 14000 and the relative impact of this new approach on the view of the effectiveness and efficiency of corporate environmental management systems and its impact on corporate performance. This concern forms the major impetus for this study.

DESIGN OF THE STUDY

The primary approach used in this research article is that of a large-scale survey. The reason for the survey was to allow the research team to collect data pertaining to the attitudes of the respondents towards environmentally responsible manufacturing, their plant's environmental management system, and ISO 14000. The survey was also used to identify factors that influence these attitudes and the perceived effectiveness and efficiency of the plant environmental management systems.

The survey consisted of five major sections. The first section gathered information about the respondent, their position, professional affiliations (if any), and extent of involvement in various corporate initiatives. The second section focused on the business unit (the basic unit of analysis) and detail about it. This included products manufactured, extent of uncertainty facing the business unit and its personnel, and the status of various initiatives. Section III dealt with the perceived impact of the ISO/QS 9000 certification process on the business unit and its competitive position in the market place. In Section IV, the respondent was asked to evaluate a series of questions pertaining to ISO 14000. These questions assessed the level of knowledge of the respondent on the ISO 14000 certification process, as well as the factors affecting its implementation and use. The fifth and final section gathered information about the business unit's environmental management system, the effectiveness and efficiency of this system and the types of options used to improve environmental performance. At the very end of the questionnaire, respondents were given some free-form space to describe any obstacles, potential or realized, to their firm implementing ISO 14000.

THE SAMPLE AND RESPONSES

A mailing list of 5000 names each were obtained from three professional associations (National Association of Purchasing Management, American Production and Inventory Control Society and one group who wishes to remain anonymous), for a total of 15,000 names. The lists were checked for duplicate names, and the few that were identified were eliminated. Where possible, the professional associations were asked to provide names of managers who worked for manufacturers, those in the two-digit SIC code range of 20 to 39.

The researchers also worked closely with a major American manufacturer, who provided an additional list of 104 managers at six of their facilities. Three waves of mailings were sent out, in what is often called the modified Dilman method. The survey was sent out in the fourth quarter of 1997 and responses were received well into 1998. 1510 usable responses were obtained, for a response rate of 10.35%. While this is lower than the 20% that researchers strive to achieve, it is possible that the length of the survey discouraged some potential respondents.

RESULTS AND DISCUSSION

With a sample of 1510 respondents, this study was faced with an "embarrassment of riches." That is, the researchers were presented with a great deal of information. This report represents an attempt to identify the critical findings from this large database. In reviewing this paper and its findings, the following major points were flagged as important:

- The respondents in this study came from a variety of industries and were in a variety of managerial positions. They also had familiarity with their position, being in the current position for an average of 5.4 years. They also had been involved in a wide range of corporate initiatives, including Continuous Improvement, new Product Launches and Reengineering.
- The plants represented in this study have worked with numerous initiatives. The initiative most frequently pursued was that of ISO 9000/QS 9000 certification; the initiative least often pursued was that of implementing an environmental management system.
- Environmental management systems are essentially multi-dimensional and complex entities. They embody data collection, reporting, performance measurement, and tools. They can affect corporate reputation; they can influence product and process design and the manner in which problems are identified and resolved. At present, most environmental management systems are implemented using a separate, formal department that is responsible for this aspect of corporate performance. They also tend to focus tactical and operational problems. Their stance is primarily reactive. That is, in most firms, these systems come into play once a problem has occurred. They are also driven by environmental regulations. Finally, they are internally oriented, with relatively little attention being devoted to environmental problems within the supply chain.
- Overall, environmental management systems are not seen in a positive light. In general, these systems are seen as having a strong negative impact on the major strategic dimensions of performance (i.e., lead time, costs and quality). They also do not really enhance the firm's competitive position in the market place. They are also not seen as improving the firm's ability to sell its products internationally. These results are influenced by the progress of the plant in attaining ISO 14000 certification.
- The ISO 14000 certification program is relatively new. As a result, there are relatively few plants that have attained this certification. Out of the 1510 respondents, only 37 (2.5%) have attained this level of certification. This number is low relative to other environmental programs such as Industrial Voluntary Environmental programs (where 284 respondents noted that they successfully implemented these programs) and Voluntary EPA programs (where 253 respondents noted successful implementation).
- Successful attainment of ISO 14000 does have a large, positive impact on the perceived efficiency and effectiveness of the environmental management system. Except for lead times, which are slightly negatively affected, ISO 14000 greatly improves every dimension of performance. This finding points to a situation where those firms that have attained this level of certification are not only more environmentally responsible, but also more efficient (and potentially better suppliers).
- The progress of a plant in attaining ISO 14000 certification is influenced by several factors. It is affected by size (the larger the firm, the more progress it is likely to have made), nature of ownership (foreign owned firms are more likely to pursue and attain ISO 14000 certification), past success with QS 9000 and ISO 9000 certification, past success with the implementation of TQM systems, and degree to which cross functional programs and teams are used.
- Progress in attaining ISO 14000 certification is also influenced by uncertainty concerning federal regulations, changes in ISO 14000 standards, the costs of certification, the benefits of certification, and the impact of the ISO 14000 standards on current environmental management systems.
- Compared with other voluntary based programs aimed at improving environmental performance, the evidence indicates that the ISO 14000 certification process is more effective and efficient when viewed in terms of its impact on performance.

In the short, the data seems to indicate that, with ISO 14000 certifications, plants can be both clean (more environmentally responsible) and green (more efficient). These are important findings for the operations manager.

References available upon request from Frank Montabon.